DIRECT TESTIMONY OF REZA NIKAIN, MARK COHEN, AND ROBERT STRAHLE:

IN THE MATTER OF: GEORGIA POWER COMPANY'S APPLICATION TO ADJUST RATES TO INCLUDE REASONABLE AND PRUDENT VOGTLE UNITS 3 AND 4 AND COMMON COSTS

PREPARED FOR:

GEORGIA PUBLIC SERVICE COMMISSION

DOCKET NO. 29849

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I. INTRODUCTION AND QUALITIFCATIONS

Q. PLEASE STATE YOUR NAMES, TITLES, AND BUSINESS ADDRESSES.

A. My name is Reza Nikain. I am a Senior Managing Director in the New York office of J.S. Held LLC (J.S. Held). My business address is 48 Wall Street, 17th Floor, New York, NY 10005.

My name is Mark Cohen. I am the Senior Managing Director in the New York office of J.S Held, and global leader for J.S. Held's Construction Advisory Practice. My business address is 48 Wall Street, 17th Floor, New York, NY 10005.

My name is Robert Strahle. I am a Managing Director in the New York office of J.S. Held and the United States lead for J.S. Held's Construction Advisory Practice. My business address is 48 Wall Street, 17th Floor, New York, NY 10005.

Q. PLEASE PROVIDE AN OVERVIEW OF J.S. HELD.

A. J.S. Held is a global consulting firm with expertise in construction advisory, environmental, health & safety, forensic accounting, water & fire restoration, equipment, and forensic architecture & engineering matters. Our Construction Advisory team of experts are often involved in both contentious and non-contentious matters including construction management, assessing risks on projects, management's standard of care, issues relating to project schedule, resource performance, disruption, inefficiency, and issues relating to scope changes, cost of performance, and various types of insurance related matters. Our team has presented expert testimony on various issues including impacts stemming from design, fabrication, site access and logistics, adverse weather conditions, schedule sequencing, construction management and, manufacturing and/or procurement of major equipment and other party failures and/or actions, as well as more recently the impacts of the COVID-19 pandemic on supply chains and labor.

Q. WHAT EXPERIENCE DOES J.S. HELD HAVE IN ANALYZING POWER PLANT PROJECT ISSUES?

A. The J.S. Held team has experience working on nuclear power plants as well as other major complex power plants such as natural gas, coal, heavy fuel oil, hydroelectric, onshore, and offshore wind, geothermal, solar, and biomass. Our assistance and involvements have included an extensive range of issues including management standard of care, prudency, scope changes, schedule prolongation, disruptions, and productivity losses, estimating and cost assessments, damage quantification and expert witness testimony across a variety of forums.

Q. MR. NIKAIN, PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.

A. I have earned a Bachelor of Science degree in Civil Engineering and Master of Science degree in Engineering Sciences from Rutgers University in New Jersey. I have post graduate studies in Business Management and Conflict Resolution. I am a registered Professional Engineer in multiple States, Canada, and Australia. I have multiple certifications including Project Management, Planning and Scheduling, Construction Auditing and Forensic Consulting. I have nearly 40 years of experience in dispute resolution, management consulting and risk management across a broad range of domestic and international engineering and construction projects, including prudency analysis of Nuclear power plants and other types of mega projects. I have both performed and led teams in the execution of engineering and construction analyses including assessing project's risks, schedule delay, disruption, acceleration, inefficiency, workmanship, change orders and damage quantification. I have also conducted assessments relating to the reasonableness of management's approach and compliance to various industry standards in managing project controls, engineering and design process and project and construction management. I have been qualified and testified as an expert witness domestically and internationally in courts and arbitrations. For nearly 10 years, I was an Adjunct Professor at Columbia University lecturing on topics relating to prevention and resolution of construction disputes. CVs for myself, Mr. Cohen and Mr. Strahle are included as Attachment 1 to our Report.

Q. MR. NIKAIN, HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE GEORGIA PUBLIC SERVICE COMMISSION (THE COMMISSION)?

A. I have not.

Q. MR. COHEN, PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.

A. I have earned a Bachelor of Science degree in Civil Engineering from Rensselaer Polytechnic Institute in New York and a Master of Business Administration degree in International Business from Fairleigh Dickenson University in New Jersey. I am a licensed Professional Engineer in New Jersey and Pennsylvania. I have over 30 years of dispute resolution, project advisory, claims analysis, risk management, and construction management experience, spanning a wide range of domestic and international projects, including oil & gas, power (including Nuclear), petrochemical, industrial, and infrastructure facilities.

I have extensive experience in the analysis of construction disputes, preparation of construction claims, and the provision of litigation support and expert witness testimony services. I have managed the performance of construction and engineering analysis including schedule delay, disruption, acceleration, change orders, productivity, causation and responsibility, cumulative impact, differing site conditions, workmanship, damage quantification, business interruption, project controls, and termination.

Q. MR. COHEN, HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE COMMISSION?

A. I have not.

Q. MR. STRAHLE, PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.

A. I have earned a Bachelor of Science degree in Civil Engineering from Virginia Tech in Virginia, completed graduate level courses in Civil Engineering at Rutgers University, and earned an Executive Master of Business Administration degree from Rutgers University in New Jersey. I am a licensed Professional Engineer in New Jersey with 33 years of experience in the engineering and construction industry in North America,

Canada, Europe, Middle East, Asia, and Africa. My experience includes managing complex projects for an EPC contractor, resolution of construction disputes, preparation of construction claims, provision of litigation support, construction cost assessments, fraud and forensic investigations, and project controls process improvement.

I have advised on projects in multiple countries across various sectors, including power (including nuclear, hydroelectric, biomass, and fossil fuel), industrial plants, oil & gas and petrochemicals, manufacturing facilities and utilities, pharmaceutical, mixed-use commercial/residential developments, natural resources, healthcare and education facilities, and civil infrastructure, including roads and bridges. My experience also includes advisory services related to claims management and prevention, construction and project management, risk management, project design and development, construction audits, policies, and procedures development, developing capital programs/program management offices for owners, construction revenue recognition guidance specialist services, bankruptcy, and merger and acquisition due diligence analysis, and scope change management. I have provided dispute related services to contractors and owners on costs, scope change, standard of care, schedule, forensic investigations, revenue recognition. I have been qualified and have presented expert testimony in various types of venues.

Q. MR. STRAHLE, HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE COMMISSION?

A. I have not.

Q. WHAT IS THE SCOPE OF YOUR ANALYSIS?

A. J.S. Held was engaged by the Georgia Public Service Commission (Commission) with respect to matters concerning the construction and commissioning of Units 3 and 4 at the Alvin W. Vogtle Electric Generating Plant (Project), in Waynesboro, Georgia. J.S. Held was requested to review the development and construction of the Project from inception through commercial operation of both Units 3 and 4. We focused our review on the project management performance, schedule execution, and cost growth for the period from VCM 17 through each Unit's Fuel Load. Our testimony encapsulates the

findings included in the J.S. Held Report, dated October 27, 2023 (Report). This Report represents J.S. Held's analysis of the Project execution and whether Management's[1] decisions were reasonable and prudent, and met the generally acceptable industry practices and the effect of various decisions on Project performance including quality, schedule, and completion cost.

Q. WHAT IS YOUR OVERALL CONCLUSION?

A. Through our review we identified several actions, conditions, and circumstances that drove the Project execution including negatively influencing the Project's schedule and cost. Our analysis determined that many of the specific risks identified by Georgia Power Company (Company) as of the Seventeenth Semi-Annual Vogtle Construction Monitoring Report (VCM 17) materialized. Only the COVID-19 pandemic could not have been reasonably anticipated. The Project was impacted by the known risks and unreasonable and imprudent management decisions, and the result were impacts and disruptions that ultimately led to significant delays and cost increases essentially across all phases of the work. These conditions were pervasive throughout much of the Project from VCM 17 through commercial operation for Unit 3 and through anticipated commercial operation of Unit 4.

The analysis of the events and conditions that caused delay and disruption concluded that SNC and the Company did not meet the standard of care expected of its management practices. To assess the actual amount, causes of delay, and quantify the related disruption costs, J.S. Held performed a forensic delay and disruption analysis and a quantification of the Project costs.

J.S. Held's forensic schedule delay and disruption analysis assessed overall Project performance, with a focus on the period post VCM 17, to quantify and apportion the impact of delays and loss of productivity associated with completing construction and

[1] For this testimony, the term "Management" collectively refers to the Company, SNC, and Bechtel (Contractor).

testing for achieving the Fuel Load milestones and thereby completion of Units 3 and 4 and determined the following:[2]

- The start of Fuel Load (and by extension the Commercial Operation Date milestone (COD)) for both units was impacted by significant delays. Unit 3 experienced a total delay of 2,661 days (7.3 years) and Unit 4 experienced a total delay of 2,603 days (7.1 years).
- During the post-VCM 17 period, since October 2017, the Project experienced delay of 734 days (24.1 months) to Unit 3 and 670 days (22.0 months) to Unit 4.
- Of the post-VCM 17 delays, the unforeseen event of COVID-19 caused 266 days (8.7 months) to Unit 3 and 211 days (6.9 months) to Unit 4.
- While the Project struggled with loss of productivity throughout the performance period, the unforeseen event of COVID-19 resulted in a combined total of XXXXX inefficient direct labor hours for Unit 3 and Unit 4. The observed indirect-to-direct labor hour ratio was applied to the total inefficient direct labor hours to calculate a total of XXXXX inefficient indirect labor hours also caused by COVID-19.

SNC was responsible for the balance of Project delay experienced post-VCM 17 of 468 days (15.4 months) to Unit 3 and 459 days (15.1 months) to Unit 4 and the balance of costs above and beyond those attributable to the COVID-19 pandemic. The balance of Project delay and cost was primarily driven by the known risk events as of VCM 17 and management decisions detailed in Section 3.3 of our Report.

In summary, the analysis estimated there were 211 calendar days of schedule delay, and XXXXXXXXXXXXX direct labor hours plus XXXXXXXXXXX indirect labor hours resulting from COVID-19. The total COVID-19 impact cost was calculated as follows.

- To quantify the time related cost impacts, the average daily rate for indirect costs during the COVID-19 impacted period was applied to the total lost days determined from the forensic schedule analysis.

[2] A summary of the delay windows and corresponding delay days are discussed further in Section 5 of the Report and presented below in Tables 4.1 and 4.2.

- To quantify the inefficiency during the COVID-19 impacted period, the hourly indirect and direct labor rates for that period were applied to the total inefficient direct and indirect labor hours to quantify efficiency impact costs.
- The total unavoidable direct costs associated with COVID-19 were determined from the available Project documentation.

The Company's portion of the costs is 45.7 percent, which yields XXXXXXXXXX in unforeseen costs stemming from the COVID-19 pandemic. The summary is shown in Table 1.1 COVID-19 Cost Impacts.

Table 1.1 COVID-19 Cost Impacts

Category	**Company Amount (45.7%)**
Delay – Indirect Costs	XXXXXXX
Inefficiency – Direct / Indirect Labor	XXXXXXX
Direct Costs	XXXXXXX
Total Costs	**XXXXXXX**

As discussed throughout our Report, the Company's total costs were $7.70 billion with the remaining $2.48 billion incurred due to unreasonable and imprudent management decisions, and therefore should be disallowed. The Company, PIA Staff, the Georgia Association of Manufacturers, Georgia Interfaith Power & Light, Georgia Watch, and Partnership for Southern Equity (the Stipulating Parties) reached agreement on August 29, 2023, that stipulated $7.56 billion as the reasonable and prudent total construction and capital costs for Vogtle Unit 3 and Unit 4. Of this $7.56 billion, $200 million is identified as COVID-19 Costs. Our analyses found the cost contained in the stipulated agreement was reasonable and prudent.

II. GENERAL OVERVIEW AND J.S. HELD'S INVOLVMENT WITH THE PROJECT

Q. WHAT INFORMATION AND DOCUMENTS DID YOU CONSIDER IN CONDUCTING YOUR ANALYSIS?

A. We have relied on the documents produced by the Commission Staff and the Company. Additionally, throughout our analysis we made requests for additional documents which were produced on a periodic basis. Documents relied on include, but are not limited to contracts and agreements, policies and procedures, Project reports, VCM reports, monthly status reports, and other contemporaneous Project files, such as logs, schedules, general correspondence, and emails. We also interviewed the Commission Staff and reviewed industry publications. These referenced documents and information are footnoted throughout our Report.

Q. PLEASE PROVIDE AN OVERVIEW OF THE PROJECT ISSUES EXPLORED.

A. Specific actions, conditions, and circumstances that impacted the Project from a project management, schedule and cost perspective are further discussed in Section 3.3 of our Report. Many of the impacts were rooted in project management decisions and actions, as well as the materialization of the known risks as of VCM 17. Others, notably the COVID-19 pandemic, could not be anticipated. The conditions and impacts analyzed included the following:

- Project management emphasis on schedule performance without adequate consideration for cost and quality impacts.
- The premature transition from bulk construction execution (such as electrical and piping installation) to system turnover work on specific portions of systems to achieve certain milestones.
- The completeness of engineering and the effectiveness of engineering management after the onboarding of the replacement contractor, Bechtel.
- Procurement related material supply and management challenges and deficiencies.
- Quality management issues including those affiliated with the prioritization of testing requirements, rework and corrective actions, and the cable separation matter.

- Labor resource management performance and supply issues.
- The COVID-19 pandemic issues.

These issues were considered within the framework of the management programs, policies and procedures put in place to determine how effectively they were managed. These management processes include quality management, time management, risk management, and cost and change management.

Q. WHAT WAS THE TIMING OF THESE ISSUES?

A. These issues were pervasive throughout the entire Project. Please refer to Figure 3.3-1 Impact Timeline, of our Report, which details the periods in which there are documented occurrences and events related to or caused by these conditions, which ultimately are the source of both schedule and cost growth during the construction, testing, and start-up of Unit 3 and Unit 4.

III. MANAGEMENT OF THE PROJECT

Q. PLEASE PROVIDE AN OVERVIEW OF YOUR METHODOLOGY.

A. To perform our project management analysis, we first familiarized ourselves with the Project by reviewing contemporaneous Project documentation, which include but are not limited to contracts and agreements, policies and procedures, Project reports, VCM reports, monthly status reports, and other contemporaneous Project files, such as logs, schedules, general correspondence, and emails. This enabled us to assess the Project specific information and evaluate how management decisions ultimately impacted Project cost and schedule.

As part of our analysis, we assessed the management of the Project with respect to Company obligations and common industry practices. Relevant common industry practices that are generally regarded within the industry as fundamental to a sound management of contracts are discussed in various professional industries publications such as the Project Management Institute (PMI), Association for the Advancement of

Cost Engineers International (AACE), Construction Management Association of America (CMAA). We also considered nuclear-industry specific required guidelines, such as the Institute of Nuclear Power Operations (INPO) and the American Society of Mechanical Engineers (ASME).

We then investigated several project management processes to determine whether the Company's management decisions were effective and reasonable. These processes include quality management, schedule management, cost management, and risk management.

Q. WHAT ARE YOUR OBSERVATIONS RELATING TO HOW THE OVERALL PROJECT WAS MANAGED?

A. Based on its level of involvement pre-Westinghouse bankruptcy, Management was aware of the conditions of the Project. These conditions encompassed the status of design and construction, as well as the unique characteristics and risks presented by this Project. Post VCM 17, Management assumed all responsibility for the engineering, procurement, construction, testing, and overall project management. Given these commonly understood responsibilities – the need for coordinating, monitoring, and controlling the engineering, procurement, construction, and testing functions – appropriate management of key areas such as risk, quality, schedule, and cost were necessary to complete the Project at a reasonable cost and time.

Quality. Management developed several QA/QC procedures and tools which generally conform with regulatory requirements and common practices. Despite timely and relevant quality management information such as unfavorable trends, deficiencies in installations and audits of quality management, the persistent quality issues indicate ineffective management of risks to quality. There were lapses in management of quality that caused unfavorable impacts to costs and schedule, such as disruption and rework. By way of example:

- In March 2021, the Root Cause Determination Report for the cable separation found inadequate enforcement of construction standards and behaviors related to electrical installations. In addition, the sample of work packages reviewed by the root cause

team did not include any documented examples of in-process surveilling and monitoring activities on the inspection reports, as defined in N1204.

- The NRC inspectors likewise found instances where the Company did not identify and report safety-related electrical raceway system construction quality issues and failed to enter these into its corrective action program.
- The NRC further noted that the cable separation issues were missed by QC inspections as far back as November 2019, nearly seven (7) months before the first issue was identified in Unit 3 and a full year before most cable separation issues were identified by Bechtel and SNC.
- Internal audits highlighted several issues related to schedule and risk management that were not effectively managed throughout the life of the Project.

Time/Schedule. Management's obligations and commitments relating to time management were comprehensive and robust, with the intent of providing meaningful processes and tools for planning, monitoring, and controlling the execution of the Project scope. Despite developing procedures that generally conformed to its obligations, Management's implementation and execution of these procedures were ineffective as it relates to managing risks related to progress and labor productivity. By way of example:

- Internal audits highlighted several scheduling issues such as not providing logical and native Primavera schedules. Absent this information, Management was unable to effectively forecast changes and properly analyze schedules.
- For a major portion of the Project period, the schedule updates did not accurately depict the level of progress and productivity actually experienced during construction execution, thereby, understating the actual progress delays to the Project and inaccurately depicting the actual recovery in the April 2019 Re-baseline forecast. As indicated in Section 4.3 of our Report, the progress information generated by the time management process is crucial to effectively manage risks relating to disruption and delay on the Project. The inaccurate information hampered Management's ability to objectively evaluate performance, timely identify emergent risks and employ foresight to avoid and /or mitigate risks to progress and productivity (inefficiency in labor).

- Despite the significant strategy shift relating to the early transition to testing, there is no evidence of a formal cost-benefit risk analysis of this strategy. The absence of such an analysis impaired Management's ability to use foresight to manage and mitigate risks to progress and labor productivity (efficiency).

Cost. Despite developing reports that generally conformed to its obligations, the information generated in these reports was not effectively utilized by SNC to manage risks related to cost growth. Although the underlying information indicated unfavorable trends in performance and costs, Management failed to implement effective mitigation measures. Instead, Management proceeded in the same manner that had produced the unfavorable trends. This approach to risk management conflicts with Management's obligations and common industry practice and precludes the primary purpose of risk management – using both historical performance and realistic projections to mitigate risks. This is particularly evident in the two examples below:

- The Project consistently failed to achieve planned Cost Performance Index (CPI) but Management repeatedly forecasted that performance would improve despite the observed trends pointing to a sustained decline.
- The monthly Vogtle Project Management Board (VPMB) progress presentations indicated that production had not achieved expectations and productivity was deteriorating month-over-month. Nevertheless, Management continued to forecast an improvement in CPI in each of the months to come.

Risk. SNC's Risk Management Program established procedures for the risk management process flow which includes identification, qualitative risk analysis, risk response planning, monitoring and control, and reviews and approvals. Generally, the Program was reasonably aligned with requirements and common industry practice.

Further, the information generated by the other key management control processes (quality, time, and cost) were contemporaneously generating information about the health of the Project and relevant trends and metrics.

Although the underlying processes supporting risk management were continually providing information relating to unfavorable Project trends, and audits identified areas

that needed improvements, effective mitigation strategies were not implemented. Historical data, such as labor performance factors, habitually displayed unfavorable performance metrics. Management nevertheless continued with the same execution strategy. This approach to risk management conflicts with SNC's obligations and commitments, as well as common industry practices; and it deprived the Project of the benefits from risk management.

Q. HOW WOULD YOU SUMMARIZE YOUR OVERALL OBSERVATIONS FOR THE MANAGEMENT OF THE PROJECT?

A. We observed that Management developed procedures to manage Project risk, quality, schedule, and cost. However, many of the identified risks materialized and were not effectively managed resulting in impacts to the Project. These impacts were compounded by optimistic schedule, productivity and cost forecasts, the COVID-19 pandemic, and Management decisions as further discussed in Sections 3.3 and 4 of our Report. The result was impacts and disruptions that ultimately led to significant delays and cost increases across all phases of the work. These conditions were pervasive throughout much of the Project from VCM 17 through Fuel Loading for both Unit 3 and Unit 4, and to some extent continued through Unit 3 COD. However, the extent of the COVID-19 pandemic could not have been reasonably anticipated.

IV. DELAY AND DISRUPTION (INEFFICIENCY) ANALYSIS

Q. WHAT INFORMATION AND DOCUMENTS DID YOU CONSIDER IN CONDUCTING YOUR DELAY ANALYSIS?

A. We have relied on documents made available to us by the Commission Staff. We examined the contemporaneous Project documentation to assess the suitability of available schedules for use in a forensic schedule analysis. We also reviewed periodic VPMBs containing progress to date, predicted completion dates, and summary critical paths. These presentations assisted in identifying changes in the Project Critical Path and enhanced our understanding of contemporaneous construction progress. Some of

these documents in PDF format appear to include charts developed as tables in spreadsheets. However, key as-built dates were obtained from the progress reported in the contemporaneous Project schedules, VPMBs, and press releases.

Q. PLEASE PROVIDE AN OVERVIEW OF YOUR DELAY ANALYSIS METHODOLOGY.

A. Based on the availability of the contemporaneous schedules, we determined an appropriate method for analyzing delay in Units 3 and 4. We performed a retrospective forensic schedule delay analysis using an industry recognized observational, dynamic, contemporaneous technique (commonly referred to as a Window Analysis method) to quantify and apportion causation for delay to the Project. We selected this method for two reasons: (a) when applied appropriately, the Windows Analysis method can provide a detailed, comprehensive, and understandable explanation of the quantum, and timing for the delays; and (b) the other primary methods are unsuitable due to deficiencies in the Contractor's schedule updates. Specifically, the numerous logic revisions and added activities make certain methods (such as Bifurcated Contemporaneous Period Analysis and Retrospective Time Impact Analysis) impracticable.

Within each window, we identified the critical path activities to Fuel Load for each Unit that were scheduled to start, finish, or be worked on during the period, then identified and measured impacts to the critical activities. To determine the critical path of activities driving the Project schedules, we first identified the critical (or longest) path as computed by the executable native Oracle Primavera P6 schedule files. Then assessed the relative total float (to the Fuel Load Milestone) values for activities to confirm the activities with the lowest total float value were driving the critical path.

The analysis compared actual as-built progress to as-planned start dates, finish dates, and durations of specific activities or milestones along the critical path during each window to identify and quantify the net delay. The analysis also identified shifts in the critical path caused by actual progress and changes to schedule logic between analysis periods. As impacts and delays were identified, we used Project documentation, records, and data to explain the causes for the quantified delay.

Q. PLEASE DESCRIBE YOUR OBSERVATIONS FROM THE WINDOW ANALYSIS.

A. The Project experienced significant delay, with a Unit 3 total delay of 2,661 days and Unit 4 total delay of 2,603 days resulting primarily from Project Management decisions, the discrete issues discussed in Section 3 of our Report, and the COVID-19 pandemic. During the post-VCM 17 period, since October 2017, the Project experienced delays of 734 days to Unit 3 and 670 days to Unit 4. The COVID-19 pandemic caused 266 days of delay to Unit 3 and 211 days of delay to Unit 4, which are reflected in Window #5 of the analysis. The tables below summarize the apportionment of delay across the six (6) windows for Units 3 and 4, which are detailed in Section 5 of our Report.

Table 4.1 Summary of Unit 3 Fuel Load Delay

Window	Window Start	Window Finish	Fuel Load Delay (days)
Window #1	April 2008	October 2017	1,927
Window #2	October 2017	October 2018	5
Window #3	October 2018	March 2019	40
Window #4	March 2019	March 2020	0
Window #5	March 2020	April 2021	266
Window #6	April 2021	Fuel Load Start	423
Total			**2,661**

Table 4.2 Summary of Unit 4 Fuel Load Delay			
Window	Window Start	Window Finish	Fuel Load Delay (days)
Window #1	April 2008	October 2017	1,933
Window #2	October 2017	October 2018	4
Window #3	October 2018	March 2019	34
Window #4	March 2019	March 2020	-61
Window #5	March 2020	April 2021	211
Window #6	April 2021	Fuel Load Start	482
Total			**2,603**

Q. WHAT INFORMATION AND DOCUMENTS DID YOU CONSIDER IN CONDUCTING YOUR DISRUPTION ANALYSIS?

A. We have relied on documents made available to us by the Commission. We examined the contemporaneous Project documentation to assess the available Project data related to progress, quantities, manhours and earned value. We reviewed documentation maintained by Bechtel, including but not limited to the Bechtel Monthly Status Reports, the Bechtel Project Hours Earnings Scorecards, and the Bechtel Quantity Unit Rate Report (QURR) Reports.

Q. PLEASE PROVIDE AN OVERVIEW OF YOUR DISRUPTION ANALYSIS METHODOLOGY.

A. Using the window time frames developed during the execution of the delay analysis, we analyzed the disruption to the execution of the Project for work areas and commodities installation. Specifically, using the data maintained by Bechtel, we analyzed impacts to the Project's execution by assessing changes to the direct labor's productivity factor (PF) defined as Actual Hours / Earned Hours during window time frames using a Measured Mile methodology. SNC and Bechtel routinely referred to factors defined as Actual Hours / Earned Hours and Actual Cost / Earned Cost as CPI. This was done using data for major work areas and commodities installation. As

disruption and inefficiency were identified, we used Project documentation, records, and data to explain the causes for the quantified impact.

Q. PLEASE DESCRIBE YOUR OBSERVATIONS FROM THE DISRUPTION ANALYSIS.

A. The Project experienced significant disruption and inefficiency to the performance of the direct labor throughout its execution. We observed negative impacts to Bechtel's direct labor's productivity factor as a result of Project Management decisions, the issues and conditions discussed in Section 3 of our Report and the COVID-19 pandemic. This negative impact was prevalent in the execution of the major work areas and commodities installation. With respect to the disruption caused by the COVID-19 pandemic, we quantified the impact to the execution of the Containment Building, Auxiliary Building, Turbine Building, Annex Building, Shield Building, Radwaste Building, Diesel Generator Building and Modules using the Bechtel direct labor data and other related data during the Window #5 time frame. Specifically, we analyzed the cumulative PF factor for each of the major work areas at the beginning and end of the Window #5 time frame. This assessment determined there was a degradation of Bechtel's cumulative PF for both Units 3 and 4 ranging from 14% to 26% for Unit 3 and 4% to 18% for Unit 4. This corresponds to XXXXXXXXXXXX direct labor hours for Unit 3 and XXXXXXXXXXX direct labor hours for Unit 4. The total combined for Unit 3 and Unit 4 was XXXXXXXXXXXXX direct labor hours caused by COVID-19. The observed indirect-to-direct labor hour ratio was applied to the total inefficient direct labor hours to calculate a total of XXXXXXXXXXX indirect labor hours caused by COVID-19.

Q. WHAT ARE YOUR CONCLUSIONS FROM THE SCHEDULE AND DISRUPTION ANALYSIS?

A. Our schedule analysis assessed overall Project performance to quantify and apportion delays to completing construction and startup scope for achieving the Fuel Load milestone (and by extension the COD milestone) and determined the following:

- The Project experienced significant delay, with a Unit 3 total delay of 2,661 days (7.3 years) and Unit 4 total delay of 2,603 days (7.1 years).
- During the post-VCM 17 period, since October 2017, the Project experienced delay of 734 days (24.1 months) to Unit 3 and 670 days (22.0 months) to Unit 4.
- Of the post-VCM 17 delays, COVID-19 caused 266 days (8.7 months) to Unit 3 and 211 days (6.9 months) to Unit 4.

The Project experienced delay post-VCM 17 of 468 days (15.4 months) to Unit 3 and 459 days (15.1 months) to Unit 4.

In addition, our disruption analysis assessed the impacts caused to the direct labor execution on the Project for the major work areas and commodities installation. During the period from March 2020 through July 2021, the analysis determined for Unit 3 and Unit 4 there was a total of XXXXXXXXXXXXX direct labor hours caused by COVID-19. The observed indirect-to-direct labor hour ratio was applied to the total inefficient direct labor hours to calculate a total of XXXXXXXXXXX indirect labor hours caused by COVID-19.

In summary, the analysis estimated there were 211 days of schedule delay, and XXXXXXXXXXXXX direct labor hours and XXXXXXXXXX indirect labor hours resulting from COVID-19.

V. QUANTIFICATION OF COST OVERRUNS

Q. PLEASE PROVIDE AN OVERVIEW OF YOUR METHODOLOGY

A. We quantified the cost overruns based on the unforeseen issues identified by the schedule and project management analysis workstreams, specifically the COVID-19 pandemic. This included our review of relevant Project cost documentation to determine average daily indirect cost rates, hourly direct and indirect labor wages, and direct costs. These rates were applied to the total delays and inefficient labor hours to quantify the Company's COVID-19 cost overrun.

Q. WHAT COSTS WERE UNFORSEEN?

A. The unforeseen cost overruns include COVID-19 delay, COVID-19 inefficiency, and COVID-19 direct costs, which total approximately XXXXXXXXX for the Company's portion of Project costs, or approximately XXXXXXXX on the total Project. **Table 5.1 COVID-19 Cost Impacts** below provides detail of the Company's portion of the COVID-19 cost impacts.

Table 5.1 COVID-19 Cost Impacts

Category	**Company Amount (45.7%)**
Delay – Indirect Costs	XXXXXXX
Inefficiency – Direct / Indirect Labor	XXXXXXX
Direct Costs	XXXXXXX
Total Costs	**XXXXXXX**

The costs were based on our analysis which determined that there were 211 days of schedule delay, XXXXX inefficient direct labor hours and XXXXX inefficient indirect labor hours, all resulting from the COVID-19 pandemic.

Q. HOW DID YOU CALCULATE THE COVID-19 DELAY INDIRECT COSTS?

A. We calculated an applicable indirect daily average cost rate to be applied to the COVID-19-related delay of 211 days in Window #5 to be approximately XXXXXXXXXXXX. At XXXXXXXXXXXXX and 211 total delay days, the total delay costs for the Project are approximately XXXXXXX, of which the Company portion is XXXXXXXXXXXX XXXXX.

SNC Project Management Reports were selected as the source documents for the analysis, allowing a greater level of detail to analyze whether costs were direct or indirect. The more detailed level of cost reports produced by SNC were called the Functional Area Cost Review Reports – Updates to TS Attachment STF-132-19 (Functional Area Cost Report), which were used to supplement information provided in the SNC Project Management Reports.

We completed a review of SNC's Project Management Cost Reports (inclusive of the Functional Area Cost Reports) and coded each cost account included in the reports as direct or indirect, or other costs based on applications of common industry guidelines and professional judgement. Each of these cost categories were totaled and averaged over each of the windows identified as part of the schedule analysis. Refer to Sections 6.1.3 and 6.2.1 of our Report, for further information related to the quantification of the COVID-19 delay-related costs and the analysis of identifying which costs were either direct, indirect, or other costs.

Q. HOW DID YOU QUANTIFY THE COVID-19 INEFFICIENCY – DIRECT/INDIRECT LABOR COSTS?

A. In addition to the delay days, our analysis separately determined that there was XXXXX XXXXXXXX in inefficient costs related to COVID-19, of which when adjusted for the Company portion, corresponds to XXXXXXX.

This was the result of our calculation of approximately XXXXXX hours related to the impact of direct labor inefficiency from COVID-19. To quantify the total direct and indirect labor hour impact, we applied XXXXXXXXXXXXXXXXXXXX to the direct labor inefficient hours value, yielding a total of approximately XXXX hours of indirect labor. The total direct and indirect labor inefficient hours total approximately XXXXX hours.

Direct and indirect labor rates were identified based on observed labor rates from Bechtel submitted change orders from the COVID-19 impacted period. These rates were XXXXXXXXXXXXXXXX and XXXXXXXXXXXXXXX. These labor rates were then applied to the inefficient labor hours for a total of XXXXXXXXXX, of which when adjusted for the Company portion, corresponds to XXXXXXX. Refer to Section 6.1.4 of our Report for further information related to the COVID-19 inefficiency costs.

Q. HOW DID YOU QUANTIFY THE COVID-19 DIRECT COSTS?

A. Our analysis also separately determined that there was XXXXXXXXXX in other direct COVID-19 costs, of which when adjusted for the Company portion, corresponds to XX XXXX.

Included in these direct costs were discrete costs such as worker isolation costs and infrastructure costs, which included costs related but not limited to medical village, medical advisors, increased cleaning, and supplies. These total COVID-19 direct costs were identified in SNC's Project Management Reports and COVID-19 change order submittals and totaled approximately XXXXXXXXXX of which when adjusted for the Company portion, corresponds to XXXXXXX. Refer to Section 6.1.5 of our Report for further information related to the COVID-19 direct costs.

VI. CONCLUSION

Q. DO YOU UNDERSTAND THE STIPULATING PARTIES AND THE COMMISSION HAVE REACHED AN AGREEMENT OF REASONABLE AND PRUDENT TOTAL CONSTRUCTION AND CAPITAL COSTS FOR VOGTLE UNITS 3 AND 4?

A. The Company, PIA Staff, the Georgia Association of Manufacturers, Georgia Interfaith Power & Light, Georgia Watch, and Partnership for Southern Equity (the Stipulating Parties) reached agreement on August 29, 2023, that stipulated $7.56 billion as the reasonable and prudent total construction and capital costs for Vogtle Unit 3 and Unit 4. Of this $7.56 billion, $200 million is identified by the Company as COVID-19 Costs. Based on our analyses and findings, as summarized in this testimony, and as further detailed in our Report, we find the stipulated amount to be reasonable and prudent.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.